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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/681,440	10/08/2003	Michael L. Rhodes	H0006006 (1100.1238101)	7116

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EXAMINER

OLSEN, KAJ K

ART UNIT	PAPER NUMBER
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1753

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/12/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/681,440

Applicant(s)

RHODES, MICHAEL L.

Examiner

Kaj K. Olsen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-39 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-39 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1-12-04; 4-21-05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim and Specification Comments

1. Throughout the disclosure, applicant utilizes an unconventional spelling for zeolite, namely “zeolyte”. The examiner cannot find any dictionary that recognizes this as being an appropriate spelling for this substance. However, because the prior art was found to contain a few examples of applicant’s spelling, the examiner cannot compel the applicant to utilize the more appropriate spelling of --zeolite--, but would recommend the applicant still do so, if for no other reason that this disclosure could be more appropriately found via word-based searches. The examiner will be relying on the more appropriate spelling for his rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 20-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. In claim 20, “non-selective ion exchange layer” has no antecedent basis in claim 10. In claim 21, this claim merely repeats the limitations from the claim it depends from (claim 10). In claim 22, applicant doesn’t appear to have ever disclosed coupling the conductive surface to both a field effect transistor and an amplifier simultaneously as the combination of claims 10 and 22

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would require. It would appear that all these claims, as well as claims 13-18, should have depended from claim 12 and not claim 10.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3, 6, and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Matsuo et al (Sensors and Actuators, 5, 1984, pp. 293-305).

7. Matsuo discloses a reference electrode having a conductive substrate (semiconductor) having a first surface and an ionically insulating hydrophobic layer (parylene) adjacent to a first surface of the substrate. See fig. 2 and the introduction. With respect to the hydrophobic layer having a plurality of non-selective ion exchange sites, the parylene comprises a small density (10^{12} cm^{-2}) of MO^- and MOH sites. See the discussion of the composition of the sites on paragraph bridging pp. 295 and 296 and the site density for parylene on p. 304. These MO^- and MOH sites read on the broadest reasonable interpretation of ion exchange sites. Moreover, the examiner does not believe that there is anything particularly ion selective about these MO^- sites and they thereby read on claimed “non-selective”. The examiner notes that p. 7, ll. 3 and 4 of the specification appears to reinforce that exchange sites of Matsuo would read on the applicant’s defined ion exchange sites.

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8. With respect to the thickness of the hydrophobic layer, Matsuo uses 85 nm of parylene.

See p. 301.

9. With respect to the ion-exchange sites comprising a layer, fig. 2 of Matsuo shows all the sites being located at the interface with the electrolyte and thereby reads on a layer of ion-exchange material.

10. Claims 1, 4-6, 9, 12, 23, and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Yoshii et al (USP 4,708,905).

11. Yoshii discloses a device comprising a conductive (i.e. metal) surface inherently having a first surface with an ionically insulating polyethylene terephthalate (PET) film, which is inherently a hydrophobic polymer. See col. 4, ll. 42-51. Yoshii further discloses the addition of zeolites to the PET film (see col. 4, ll. 32-41). Applicant evidences that zeolites are a non-selective ion exchange material. With respect to the device being a reference electrode, that is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability.

12. With respect to the thickness of the hydrophobic layer, see claim 2 of Yoshii.

13. With respect to the combination of conductive and non-conductive layers, Yoshii teaches coating the metal surface with a polycarbonate. See col. 9, ll. 3-14. The metal and polycarbonate would read on the defined conductive and non-conductive layers respectively.

14. With respect to the ion-exchange material forming a layer, because claims 12 and 23 state that this layer can be “on or in the ionically insulating hydrophobic layer” (emphasis added), the examiner will construe the mixture of zeolite inside the hydrophobic layer of Yoshii as read on the defined ion-exchange layer of these claims because these claims state that the ion exchange

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layer could be in the hydrophobic layer. Moreover, applicant's specification (p. 7, ll. 3-4) indicates that simple impurities on the surface of a hydrophobic layer would meet the claim requirement for non-selective ion exchange materials. Hence, any impurities on the surface of the hydrophobic dielectric of Yoshii would also meet the claimed surface of non-selective ion exchange material, giving the claim language its broadest reasonable interpretation.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuo in view of Nakajima et al (J. Electrochem. Soc, 129, 1982, pp. 141-143).

17. Matsuo set forth all the limitations of the claim, but did not explicitly recite the polytetrafluoroethylene (PTFE) as the hydrophobic layer. However, Nakajima (with overlapping inventorship to Matsuo) taught that Teflon (i.e. PTFE) is also a hydrophobic membrane with low site density (like the parylene of Matsuo). See abstract and the Experimental section. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Nakajima for the electrode of Matsuo because the substitution of one known hydrophobic insulating layer for another requires only routine skill in the art.

18. Claims 2 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshii in view of Munshi (USP 6,426,861).

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19. Yoshii set forth all the limitations of the claims, but did not explicitly disclose the use of PTFE as the hydrophobic layer. Munshi teaches in an alternate capacitor that both PTFE and PET (the dielectric relied on by Yoshii) are known dielectrics in the capacitor art with each having their requisite advantages and disadvantages. In particular, PTFE provides lower k and higher operating temperatures, but has lower voltage breakdown and energy density. See table 1 in col. 2 and col. 17, ll. 7-13. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Munshi for the capacitor of Yoshii because the substitution of one known dielectric for another requires only routine skill in the art. Furthermore, one possessing ordinary skill in the art would have been motivated to utilize PTFE when one desires lower-k dielectrics with higher operating temperatures.

20. Claims 3 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshi in view of Early (USP 6,094,335).

21. Yoshii set forth all the limitations of the claims, but did not explicitly recite the use of silicon as a conductive substrate. Early teaches that any number of conductive materials find utility in the capacitor art including metals (as utilized by Yoshii) as well as silicon. See col. 5, l. 65 through col. 6, l. 7. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Early for the device of Yoshii because the substitution of one known electrode material for another requires only routine skill in the art.

22. Claims 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuo in view of Colapicchioni et al (USP 5,160,597).

23. Matsuo set forth all the limitations of the claims, but did not explicitly recite the use of an adhesion promoter for the hydrophobic membrane. Colapicchioni discloses that siloxanes can be

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utilized to facilitate the adhering of a membrane to a FET surface of a sensor. See col. 1, l. 58 through col. 2, l. 9. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Colapicchioni for the sensor of Matsuo in order to improve the adhesion of the hydrophobic layer of Matsuo to its FET.

24. Claims 7, 8, 27, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshii in view of Monden et al (USP 6,483,694).

25. Yoshii set forth all the limitations of the claims, but did not explicitly recite the use of an adhesion promoter. Monden teaches the use of siloxanes for the promotion of adhesion between the electrodes and the dielectric. See col. 2, ll. 34-43. It would have been obvious to one of ordinary skill in the art at the time the invention was being made to utilize the teaching of Monden for the device of Yoshii so as to increase the bonding strength between the electrode and dielectric.

26. Claims 10, 11, 13, 14, 17-19, 21, 22, 31-33 and 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuo (with or without Nakajima or Colapicchioni) in view of Yano et al (USP 4,269,682).

27. With respect to these claims (those limitations not covered above), Matsuo with or without Nakajima and/or Colapicchioni sets forth all the limitations of the claims, but does not explicitly disclose coupling the conductive surface to either an amplifier or FET. Yano teaches in an alternate FET based reference electrode that these electrodes can be conventionally connected to both an amplifier (37, 38) and another FET device (32 or 33). See fig. 4. Because the conductive surface of Matsuo is the source and drain portion of the its FET, the sensor configuration shown by fig. 4 of Yano, which has the various source and drain leads connected

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both to other FETs and to amplifiers, this would read on the claim limitations requiring electrical coupling to both amplifiers and field effect transistors.

28. Claims 10, 11, 13-22, and 29-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yoshii with or without Munshi, Early, or Monden in view of Diefenderfer (Principle of Electronic Instrumentation, 2nd Edition, 1979, pp. 159 and 226).

29. With respect to claims 10, 13-21 and 29 (those limitations not covered above), Yoshii with or without Munshi, Early, or Monden disclosed all the limitations of the claims, but did not explicitly disclose coupling the conductive surface to an amplifier. However, Yoshii was constructing a capacitor and capacitors are routinely coupled to amplifiers. Page 226 of Diefenderfer demonstrates just two of the myriad of possibilities for coupling a capacitor to an amplifier. See the integrators and differentiators of fig. 9-11. It would have been obvious to one of ordinary skill in the art at the time the invention was being made would have recognized that the capacitors of Yoshii could have been coupled to amplifiers, as shown by Diefenderfer, so as to construct art useful devices such as integrators and differentiators.

30. With respect to claims 11, 22, 30-39 (those limitations not covered above), Diefenderfer also discloses that it is conventional in the art to couple capacitors, like the capacitors of Yoshii, to field effect transistors as well. See p. 159 where a common source amplifier is constructed. It would have been obvious to one of ordinary skill in the art at the time the invention was being made would have recognized that the capacitors of Yoshii could have been coupled to field effect transistors, as shown by Diefenderfer, so as to construct art useful devices such as common source amplifiers.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaj Olsen whose telephone number is (571) 272-1344. The examiner can normally be reached on Monday through Friday from 8:00 A.M. to 4:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

AU 1753
March 7, 2007


KAJ K. OLSEN
PRIMARY EXAMINER